When the repairing method of the present invention is used, the gate signal line driving circuit controls signals to be inputted to gate signal lines to turn switching TFTs ON whereas EL driving TFTs are turned ON by analog video signals inputted to source signal lines from the source signal line driving circuit.

[Embodiment 5]

This embodiment describes a case of applying a repairing method of the present invention to an EL element whose EL layer comprises a plurality of layers.

Fig. 9A shows the structure of the EL element. First, a hole injection layer is formed by spin coating to a thickness of 30 nm from PEDOT that is a polythiophene derivative on an anode formed of a compound of indium oxide and tin oxide (ITO). Next, an MTDATA layer with a thickness of 20 nm and an α-NPD layer with a thickness of 10 nm are formed by evaporation as a hole transporting layer. On the hole transporting layer, a light emitting layer is formed of a self-luminous material, Alq_3, that is a singlet compound by evaporation to a thickness of 50 nm. Then a cathode is formed by depositing Yb through evaporation to a thickness of 400 nm to complete the EL element.

If a pin hole is opened and a defect portion is formed in the light emitting layer of the EL element structured as above, the Yb layer that is the cathode is undesirably brought into contact with the α-NPD layer that is the hole transporting layer in the defect portion.

When a reverse bias current is caused to flow in the EL element having the defect portion at given time intervals, the temperature in the defect portion is raised so that the defect portion is burnt out, vaporized, or oxidized or carbonized to be transformed into an insulator. As a result, the defect portion is changed into the transmuted portion to

increase the resistance thereof. Therefore degradation of a part of the EL layer that surrounds the transmuted portion is not accelerated.

Light emitted from this EL element utilizes singlet excitation energy from the singlet compound.

Fig. 9B shows the structure of another EL element. First, a hole injection layer is formed by evaporation to a thickness of 20 nm from copper phthalocyanine on an anode formed of a compound of indium oxide and tin oxide. Next, a hole transporting layer is formed from α-NPD by evaporation to a thickness of 10 nm. On the hole transporting layer, a light emitting layer is formed of self-luminous materials, $Ir(ppy)_3$ and CBP, that are triplet compounds by evaporation to a thickness of 20 nm. An electron transporting layer is formed on the light emitting layer by forming a BCP layer with a thickness of 10 nm and an Alq_3 layer with a thickness of 40 nm through evaporation. Then a cathode is formed by depositing Yb through evaporation to a thickness of 400 nm to complete the EL element.

If a pin hole is opened and a defect portion is formed in the light emitting layer of the EL element structured as above, the BCP layer that is the electron transporting layer is undesirably brought into contact with the α-NPD layer that is the hole transporting layer in the defect portion.

When a reverse bias current is caused to flow in the EL element having the defect portion at given time intervals, the temperature in the defect portion is raised so that the defect portion is burnt out, vaporized, or oxidized or carbonized to be transformed into an insulator. As a result, the defect portion is changed into the transmuted portion to increase the resistance thereof. Therefore degradation of a part of the EL layer that surrounds the transmuted portion is not accelerated.

Light emitted from this EL element utilizes triplet excitation energy from the triplet compounds.

Fig. 10A shows the structure of still another EL element. First, a hole injection layer is formed by spin coating to a thickness of 30 nm from PEDOT that is a polythiophene derivative on an anode formed of a compound of indium oxide and tin oxide (ITO). On the hole injection layer, a light emitting layer is formed of a self-luminous material, Alq_3, that is a singlet compound by evaporation to a thickness of 50 nm. Then a cathode is formed by depositing Pb through evaporation to a thickness of 400 nm to complete the EL element.

If a pin hole is opened and a defect portion is formed in the light emitting layer of the EL element structured as above, the Pb layer that is the cathode is undesirably brought into contact with the PEDOT layer that is the hole injection layer in the defect portion.

When a reverse bias current is caused to flow in the EL element having the defect portion at given time intervals, the temperature in the defect portion is raised so that the defect portion is burnt out, vaporized, or oxidized or carbonized to be transformed into an insulator. As a result, the defect portion is changed into the transmuted portion to increase the resistance thereof. Therefore degradation of a part of the EL layer that surrounds the transmuted portion is not accelerated.

Light emitted from this EL element utilizes singlet excitation energy from the singlet compound.

Fig. 10B shows the structure of yet still another EL element. First, a cathode is formed by evaporation from Pb to a thickness of 400 nm. On the cathode, a light emitting layer is formed of a self-luminous material, Alq_3, that is a singlet compound by evaporation to a thickness of 50 nm. Next, a hole injection layer is formed by spin coating to a thickness of 30 nm from PEDOT that is a polythiophene derivative. An Au